ABSTRACT

RESEARCH PAPER: Technology in the Classroom: Student Understanding of Image Formation by Converging and Diverging Lenses and Mirrors - Ray Tracing v. Computer Simulation

STUDENT: James A. Clark

DEGREE: Master of Arts in Education (Physics)

COLLEGE: Sciences and Humanities

DATE: December 2011

PAGES: 50

As technology has become a larger influence in education, governments and school administrators have increased their calls for utilization of computer technology in teaching. In physics, computer simulations for laboratory investigations are an attractive application of technology. This study examines the teaching and learning of image formation in converging and diverging mirrors and lenses using geometric optics. Data were collected using physics students from two similar high school sections enrolled in the same course with the same teacher. One section performed a traditional ray tracing image formation lab activity using paper, pencils, and rulers, and the other section performed a computer simulated image formation activity. The groups switched roles for the mirror and lens activities so that each student performed one computer simulation activity and one paper and pencil lab activity. Student performance was evaluated using pretests and posttests. The data showed a significant advantage in student performance associated with the more traditional paper and pencil activity. It is evident from this study that a computer-based or higher technology teaching strategy may not always be the most beneficial for students.